



UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
REGION I  
475 ALLENDALE ROAD  
KING OF PRUSSIA, PA 19406-1415

December 22, 2010

Mr. David Heacock  
President and Chief Nuclear Officer  
Dominion Resources  
5000 Dominion Boulevard  
Glen Allen, VA 23060-6711

SUBJECT: MILLSTONE POWER STATION – NRC EVALUATION OF CHANGES, TESTS,  
OR EXPERIMENTS AND PERMANENT MODIFICATIONS TEAM INSPECTION  
REPORT 05000336/2010010 AND 05000423/2010010

Dear Mr. Heacock:

On November 18, 2010, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your Millstone Power Station Unit 2 and Unit 3. The enclosed inspection report documents the inspection results, which were discussed on November 18, 2010, with Mr. A. J. Jordan, Site Vice President, and other members of your staff.

The inspection examined activities conducted under your license as they relate to safety and compliance with the Commission's rules and regulations and with the conditions of your license. In conducting the inspection, the team reviewed selected procedures, calculations and records, observed activities, and interviewed station personnel.

Based on the results of this inspection, no findings were identified.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter, its enclosure, and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of the NRC's document system (ADAMS). ADAMS is accessible from the NRC Web site at <http://www.nrc.gov/reading-rm/adams.html> (the Public Electronic Reading Room).

Sincerely,

Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

Docket Nos.: 50-336; 50-423  
License Nos.: DPR-65, NPF-49

Enclosure: Inspection Report No. 05000336/2010010 and 05000423/2010010  
w/Attachment: Supplemental Information

cc w/encl: Distribution via ListServ

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/RA/

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DATE	12/21/10	12/22/10	12/22/10				

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[ROPreportsResource@nrc.gov](mailto:ROPreportsResource@nrc.gov)

L. Doerflein, DRS

S. Pindale, DRS

U.S. NUCLEAR REGULATORY COMMISSION

REGION I

Docket Nos.: 50-336, 50-423

License Nos.: DPR-65, NPF-49

Report Nos.: 05000336/2010010; 05000423/2010010

Licensee: Dominion Nuclear Connecticut, Inc.

Facility: Millstone Power Station, Units 2 and 3

Location: P. O. Box 128  
Waterford, CT 06385

Inspection Period: November 1 through November 18, 2010

Inspectors: S. Pindale, Senior Reactor Inspector, Division of Reactor Safety (DRS),  
Team Leader  
M. Orr, Reactor Inspector, DRS  
J. Rady, Reactor Inspector, DRS

Approved By: Lawrence T. Doerflein, Chief  
Engineering Branch 2  
Division of Reactor Safety

## **SUMMARY OF FINDINGS**

IR 05000336/2010010, 05000423/2010010; 11/01/2010 – 11/18/2010; Millstone Power Station, Units 2 and 3; Engineering Specialist Plant Modifications Inspection.

This report covers a two week on-site inspection period of the evaluations of changes, tests, or experiments and permanent plant modifications. The inspection was conducted by three region based engineering inspectors. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

No findings were identified.

## REPORT DETAILS

### 1. REACTOR SAFETY

#### Cornerstones: Initiating Events, Mitigating Systems, and Barrier Integrity

#### 1R17 Evaluations of Changes, Tests, or Experiments and Permanent Plant Modifications (IP 71111.17)

#### .1 Evaluations of Changes, Tests, or Experiments (34 samples)

##### a. Inspection Scope

The team reviewed nine safety evaluations to determine whether the changes to the facility or procedures, as described in the Updated Final Safety Analysis Report (UFSAR), had been reviewed and documented in accordance with 10 CFR 50.59 requirements. In addition, the team evaluated whether Dominion had been required to obtain NRC approval prior to implementing the changes. The team interviewed plant staff and reviewed supporting information including calculations, analyses, design change documentation, procedures, the UFSAR, the Technical Specifications (TS), and plant drawings to assess the adequacy of the safety evaluations. The team compared the safety evaluations and supporting documents to the guidance and methods provided in Nuclear Energy Institute (NEI) 96-07, "Guidelines for 10 CFR 50.59 Evaluations," as endorsed by NRC Regulatory Guide 1.187, "Guidance for Implementation of 10 CFR 50.59, Changes, Tests, and Experiments," to determine the adequacy of the safety evaluations.

The team also reviewed a sample of twenty five 10 CFR 50.59 screenings for which Dominion had concluded that no safety evaluation was required. These reviews were performed to assess whether Dominion's threshold for performing safety evaluations was consistent with 10 CFR 50.59. The sample included design changes, calculations, and procedure changes.

The team reviewed the safety evaluations that Dominion had performed and approved during the time period covered by this inspection (i.e., since the last modifications inspection) not previously reviewed by NRC inspectors. The screenings were selected based on the safety significance, risk significance, and complexity of the change to the facility.

In addition, the team compared Dominion's administrative procedures used to control the screening, preparation, review, and approval of safety evaluations to the guidance in NEI 96-07 to determine whether those procedures adequately implemented the requirements of 10 CFR 50.59. The reviewed safety evaluations and screenings are listed in the Attachment.

##### b. Findings

No findings were identified.

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.2 Permanent Plant Modifications (14 samples)

.2.1 Charging Pump 'A' and 'C' Rotating Assembly Replacement

a. Inspection Scope

The team reviewed a modification (M3-07001) that replaced the 'A' and 'C' charging pump rotating assemblies at Unit 3. The 'B' charging pump had previously failed while in-service, and this modification upgraded the pump shaft with an improved material (Inconel 625). Additional shaft design changes were made as part of the modification to reduce shaft stress.

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the charging system had not been degraded by the modification. The team reviewed Dominion's implementation of the modification, which included a review of the adequacy of the post-modification test results. The team interviewed the engineering staff regarding the design, installation, and testing of the new rotating assemblies to assess the adequacy of the modification. The team reviewed various documents to verify that the installation was accomplished in accordance with design assumptions and determine if the performance of the charging pumps was acceptable. The team also confirmed that surveillance tests, operational procedures, and drawings had been appropriately updated to reflect the modification. The team reviewed condition reports (CR) and completed surveillance test results to determine if reliability or performance issues resulted from the modification. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.2 Evaluation of Stem Thrust Requirements for 3RHS\*MV8701B/8702A

a. Inspection Scope

The team reviewed a Unit 3 calculation (Report 1824 – Part 39) that was revised to increase the open and close running load limits from 2500 to 5000 pounds on motor-operated valves (MOV) 3RHS\*MV8701B/8702A. The MOVs are residual heat removal system containment isolation valves.

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the MOVs had not been adversely affected by the calculation revision. The team reviewed various documents to ensure the valves were operated in accordance with design assumptions and instructions. The team reviewed CRs to determine if reliability or performance issues existed with the valves. The 10 CFR 50.59 screening determination associated with this calculation was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

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b. Findings

No findings were identified.

2.3 Replacement of Charging Pump Pulsation Dampeners

a. Inspection Scope

The team reviewed a modification (M2-07002) that replaced the nitrogen filled bladder type pulsation dampeners with liquid filled pulsation dampeners in the discharge piping of the three positive displacement charging pumps at Unit 2. The bladder type dampeners were replaced due to the potential for bladder failure, which could cause gas binding in the charging system.

The team conducted the review to ensure that the design bases, licensing bases, and the performance capability of the charging system had not been adversely affected by the modification. The team reviewed Dominion's installation work orders, which included a review of the adequacy of the post-modification test results. The team interviewed the engineering staff regarding the design, installation, and testing of the new pulsation dampeners to assess the adequacy of the modification. The team walked down the accessible portions of the new equipment to assess the material condition of the system, and to ensure the pulsation dampeners were installed in accordance with design assumptions and instructions. The team also confirmed that surveillance tests, operational procedures, and drawings had been appropriately updated to reflect the design change. The team reviewed CRs and completed surveillance test results to determine if reliability or performance issues resulted from the modification. The 10 CFR 50.59 screening determination associated with this modification was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2.4 Net Positive Suction Head Available to 3QSS\*P3A,B

a. Inspection Scope

The team reviewed a Unit 3 calculation, P(R)-1062, that was revised to incorporate proposed changes to the refueling water storage tank (RWST) maximum water temperature and to correct the design input for the quench spray (QS) system flow to address a flow assumption deficiency identified in CR-07-06330. The calculation revision documented the net positive suction head (NPSH) available and the associated margin to NPSH required for the QS pumps in support of increasing the maximum RWST temperature to 85 degrees Fahrenheit (°F) (stretch power uprate).

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the QS system had not been adversely affected by the revision

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to the calculation. The team reviewed the design of the QS system to assess the adequacy of the calculation. The team walked down the accessible portions of the QS system to evaluate the material condition. The team also confirmed that related documents and procedures were updated as necessary to reflect the revision. The team reviewed CRs to determine if reliability or performance issues existed with the QS pumps. The 10 CFR 50.59 screening determination associated with this calculation was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2.5 Reactor Plant Component Cooling System Surge Tank Sizing Calculation

a. Inspection Scope

The team reviewed a Unit 3 calculation, P(R)-711, which was revised to update the reactor plant component cooling water (CCW) surge tank volume based on items such as thermal expansion and contraction, and volume lost due to moderate energy line breaks. The calculation revision also updated the range of CCW system temperature to address the maximum temperature derived in the stretch power uprate of 155°F.

The team conducted the review to ensure that the design bases, licensing bases, and performance capability of the CCW system had not been adversely affected by the revision to the calculation. The team reviewed the design of the CCW system to assess the adequacy of the calculation. The team walked down the accessible portions of the CCW system to evaluate the material condition. The team also confirmed that related documents and procedures were updated as necessary to reflect the revision. The team reviewed CRs to determine if reliability or performance issues existed with the CCW pumps. The 10 CFR 50.59 screening determination associated with this calculation was also reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2.6 Over-Power Delta Temperature/Over-Temperature Delta Temperature Electronic Filter

a. Inspection Scope

The team reviewed an over-power delta temperature/over-temperature delta temperature (OPDT/OTDT) modification (DM3-00-0189-07) at Unit 3 in which the OPDT rate/lag cards were replaced and reconfigured for the hot leg temperature ( $T_{hot}$ ) signal. The  $T_{hot}$  temperature signal from each reactor coolant system (RCS) hot leg is used to generate the auctioneered high vessel average temperature ( $T_{avg}$ ) and delta temperature protection and control signals. The modification was performed because Unit 3

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observed short duration temperature measurement variations from each of three locally mounted temperature sensors due to fluid stratification within the RCS hot legs.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the OPDT/OTDT trips had not been degraded by the modification. The team reviewed setpoint calculations and technical evaluations to assess whether the modification was consistent with design assumptions. Modified components were reviewed to ensure that the modification conformed to the design specifications. Design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. The team also verified selected drawings, calculations, instrument calibration sheets, and procedures were properly updated based on the new system configuration. The team reviewed the post-modification testing, instrument calibration data sheets, and surveillance testing to verify the results indicated the system would function in accordance with design requirements. The team reviewed CRs associated with the system to verify that deficiencies were appropriately identified and corrected. Additionally, the team conducted interviews with engineering staff to verify the affected components functioned in accordance with the design requirements, and to determine if the modification corrected the previously identified problem. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified

.2.7 Pressurizer Level Control Program

a. Inspection Scope

The team reviewed a Unit 3 modification (DM3-00-0298-07) that changed the pressurizer level program as a function of RCS auctioneered high vessel  $T_{avg}$ . The function of the pressurizer level control system is to maintain the pressurizer water level at or near its programmed level as a function of  $T_{avg}$ . The pressurizer level program provides an approximate constant mass inventory in the RCS so that the chemical and volume control system charging rate remains relatively constant during load changes. The modification was performed because there was a change in RCS normal plant operating conditions resulting from the stretch power uprate that caused an increase in shrink and/or swell within the pressurizer during normal plant operations. To accommodate this increased shrink and/or swell, the pressurizer level program as a function of RCS  $T_{avg}$  was revised to provide a wider level control band for the no-load to full load range of RCS  $T_{avg}$  temperatures.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the pressurizer level control program had not been degraded by the modification. The team reviewed instrument scaling calculations and technical evaluations to assess whether the modification was consistent with design assumptions. Instrument calibration requirements and design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. The team also verified that selected drawings, instrument calibration sheets, and procedures were

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properly updated based on the new system configuration. The team reviewed the post-modification and surveillance test results to verify proper operation of the system. Finally, the team reviewed CRs associated with the system to verify that deficiencies were appropriately identified and corrected. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.8 Inadequate Circuit Isolation of Service Water Pump Discharge Motor-Operated Valves 3SWP\*MOV102A and 3SWP\*MOV102C

a. Inspection Scope

The team reviewed a Unit 3 modification (DM3-00-0190-08) that removed the control function from the fire transfer switch panel for the train 'A' service water (SW) pump discharge MOVs 3SWP\*MOV102A and 3SWP\*MOV102C close circuits. Remote control functions for these MOVs were originally needed for post-fire safe shutdown when evacuation of the main control room was required due to a fire. The modification was performed because it was identified that the close circuits associated with these two MOVs passed through the control room area and did not have the required isolation capability. Fire damage to the close circuitry could disable operation of the MOVs from the fire transfer switch panel or it could cause spurious operation of the MOVs. The modification hard-wired the MOV close signals within the control circuits of their respective SW pumps, which eliminated the need to manually close the valves from the fire transfer switch panel. The team's review was performed to verify that the design bases, licensing bases, and performance capability of the close function of MOVs 3SWP\*MOV102A and 3SWP\*MOV102C had not been degraded by the modification. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report.

The team assessed if the modification was consistent with requirements in the design and licensing bases. The team reviewed technical evaluations to assess whether the modification was consistent with design assumptions. Elementary wiring diagrams were reviewed to ensure that the modification conformed to the design specifications. The team also verified that selected drawings and procedures were properly updated based on the new equipment configuration. The team reviewed the post-modification and surveillance test results to verify proper operation of the modified MOV circuits. The team reviewed CRs associated with the equipment to verify that deficiencies were appropriately identified and corrected. The team performed a walkdown of the accessible components of the system (i.e., selector switches and valve position indicators on the fire transfer switch panel) to identify any abnormal conditions. Additionally, the team conducted interviews with engineering staff to verify affected systems and/or components functioned in accordance with the design assumptions, and to verify the modification corrected the previously identified problem. The documents reviewed are listed in the Attachment.

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b. Findings

No findings were identified.

2.9 Power-Operated Relief Valve 2-RC-404 Resistance Temperature Detector Relocation and Setpoint Change

a. Inspection Scope

The team reviewed a Unit 2 modification (DM2-03-0128-08) that relocated resistance temperature detector (RTD) TE-114 downstream of power operated relief valve (PORV) 2-RC-404. The function of TE-114 is to provide indication and high temperature annunciation of 2-RC-404 discharge temperature. The modification was performed because the existing location of RTD TE-114 resulted in high temperature readings due to conduction heat transfer between RTD TE-114 and its associated PORV. Specifically, it was a challenge to operators to discern between PORV leakage and conduction heat transfer in the prior configuration. The relocation of the RTD downstream of the PORV also allowed the original annunciator setpoint of 165°F to be restored and provided operations with a more accurate determination of PORV leakage.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the PORV leakage temperature monitoring configuration had not been degraded by the modification. The team reviewed technical evaluations to assess whether the modification was consistent with design assumptions. Instrument calibration requirements were reviewed to verify that the configuration met the manufacturer's specifications. Design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. Instrumentation setpoints and scaling were reviewed to ensure design limits were not exceeded. The team verified that selected drawings, instrument calibration sheets, and procedures were properly updated based on the new system configuration; and reviewed the post-modification testing to verify proper operation of the new configuration. The team reviewed CRs associated with the equipment or system to verify that deficiencies were appropriately identified and corrected. The team conducted interviews with engineering staff to verify the modified RTD functioned in accordance with the design assumptions, and to verify the modification corrected the previously identified problem. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

## .2.10 Vital Inverters Replacement

### a. Inspection Scope

The team reviewed a modification (M3-06004) that replaced the existing Unit 3 vital inverters, manual bypass switches, and regulation transformers with new equipment. The 120 Vac vital bus system is designed to supply control and instrument power to plant equipment that is credited in the design bases accident analysis. The vital inverters, regulating transformers, and manual bypass switches are designed to meet this design function by supplying safety-related, regulated, 120 Vac power to the vital instrumentation loads. The modification was performed because the system was in Maintenance Rule (a)(1) status due to frequent functional failures. The existing inverters and their associated equipment were becoming unreliable, and many of the components within the inverters were obsolete.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the new vital inverter system had not been degraded by the modification. The team reviewed calculations and technical evaluations, and interviewed engineering staff, to assess whether the modification was consistent with design assumptions. Power requirements were reviewed to verify that the equipment met the manufacturer's specifications and did not adversely affect other support systems. Replacement components and materials were reviewed to ensure that the modification conformed to the design specifications. Design assumptions were reviewed to evaluate whether they were technically appropriate and consistent with the UFSAR. Supporting electrical calculations and analyses for the loading and sizing requirements were reviewed to ensure design limits were not exceeded. The team also verified that selected drawings, calculations, and procedures were properly updated based on the new equipment configuration. The team reviewed the post-modification and surveillance test results to verify proper operation of the new vital inverter system. The team reviewed CRs associated with the system to verify that deficiencies were appropriately identified and corrected. The team performed a walkdown of the accessible components of the system to identify any abnormal conditions and to verify proper operation of the system while in-service. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the attachment.

### b. Findings

No findings were identified.

## .2.11 Removal of Check Valve 2-CS-26 Internals and Relocation of TS-2542

### a. Inspection Scope

The team reviewed a Unit 2 modification (DM2-00-0152-07) that removed the internal components of check valve 2-CS-26 and also relocated and replaced an existing temperature switch (TS-2542) assembly (i.e., thermostat, capillary tube, sensing bulb) in the associated piping with a new assembly. The check valve was located in the

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minimum flow return line to the RWST. It had a passive safety function as a pressure boundary and a design function to prevent back flow from the RWST to the high and low pressure emergency core cooling systems (ECCS) and the containment spray (CS) system. Dominion implemented this modification after determining that a failure of this valve to open could result in insufficient minimum recirculation flow and a loss of ECCS and CS pumps during certain postulated scenarios. Additionally, the back flow protection that this valve provides was redundant. Relocation of TS-2542 and its sensing bulb was to improve the effectiveness of the electric heat tracing circuit.

The team reviewed the modification to verify that the design bases, licensing bases, and performance capability of the ECCS and CS systems had not been degraded by the modification. The team reviewed the documentation supporting Dominion's evaluation that determined it was acceptable to remove the check valve's internals to assess its adequacy. The team reviewed Dominion's maintenance activities and post-modification testing results to verify proper setpoint and calibration of the temperature switch. The team verified calculations, drawings, procedures, and design bases documents were updated to reflect the modification. The team also interviewed engineering staff and conducted a walkdown of the RWST tank area and the 2-CS-26 valve to identify any abnormal conditions and determine if the material condition was acceptable. The 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

2.12 EDG Operating Time with 24,000 Gallons of Ultra Low Sulfur Diesel Fuel

a. Inspection Scope

The team reviewed a Unit 2 calculation (DM2-00-0042-07) that was revised to determine the length of time that the emergency diesel generators (EDG) could operate at the continuous rated load of 2750 kW utilizing a maximum of 24,000 gallons of fuel, which was the amount of fuel required to be stored in the diesel fuel oil supply tanks as per the Unit 2 TSs. The modification was implemented to calculate any changes to engine fuel oil consumption rates or run times due to the use of ultra low sulfur diesel fuel.

The team assessed whether the modification was consistent with assumptions in the design and licensing bases. The team reviewed the associated revision and discussed the calculation with the responsible design engineer to verify the assumptions were appropriate. The team conducted a walkdown of the EDG enclosures to assess material condition. Additionally, the 10 CFR 50.59 screening determination associated with this modification was reviewed as described in section 1R17.1 of this report. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.13 Addition of Instrumentation Pulsation Dampeners

a. Inspection Scope

The team reviewed a Unit 3 modification (DM3-00-1598-96) that upgraded the material of instrumentation line pressure pulsation dampeners (snubbers). The snubbers provide pressure dampening and filtering to prevent damage to associated pressure gauges or transmitters. The modification was performed as a revision to add a commercial grade, seismically rugged, non-environmentally qualified item for purchase and dedicated use. This item was an upgrade to previous snubber installations in various pressure indicator sensing lines where gauges/instruments have required frequent replacement and extended out-of-service time due to excessive wear caused by pressure pulsations.

The review was performed to verify that the design bases, licensing bases, and performance capability of the pressure-sensing instrumentation had not been degraded by the modification. The team reviewed technical evaluations to assess whether the modification was consistent with design assumptions. The modification requirements and procurement receipt documentation were reviewed to verify the components met the manufacturer's specifications, material codes, non-magnetic requirements, and dimensions. The team conducted interviews with engineering staff to verify that the affected pressure instrumentation functioned in accordance with the design assumptions and to verify that the modification corrected the previously identified problem. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

.2.14 Service Water Pump Strainer Backwash Piping to Alternate Bay – Operating Procedure

a. Inspection Scope

The team reviewed a revision to the Unit 2 system operating procedure OP 2326D, "Service Water Pump Strainer Backwash Piping to Alternate Bay." The purpose of this procedure modification was to 1) reconfigure the SW pump strainer backwash piping from its normal discharge path to an alternate discharge path, to be used during concurrent SW bay draining, cleaning or other maintenance; and 2) to add a compensatory operator action during the alternate discharge piping tie-in activity.

The team's review was performed to verify that the design bases, licensing bases, and performance capability of the service water system had not been degraded by the modification. The team reviewed system operating procedures, related maintenance activities, and surveillance and post maintenance test results to assess whether the modification was consistent with design assumptions. The team conducted interviews

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with engineering staff to verify the intent and adequacy of the modification, and to verify that modification corrected the previously identified problem. The team performed a walkdown of the Unit 2 intake structure and accessible components of the system to identify any abnormal conditions and to verify proper operation of the equipment while in-service. The documents reviewed are listed in the Attachment.

b. Findings

No findings were identified.

**4. OTHER ACTIVITIES**

**4OA2 Identification and Resolution of Problems (IP 71152)**

a. Inspection Scope

The team reviewed a sample of CRs associated with 10 CFR 50.59 and plant modification issues to determine whether Dominion was appropriately identifying, characterizing, and correcting problems associated with these areas, and whether the planned or completed corrective actions were appropriate. In addition, the team reviewed CRs written on issues identified during the inspection to verify adequate problem identification and incorporation of the problem into the corrective action system. The CRs reviewed are listed in the Attachment.

b. Findings

No findings were identified.

**4OA6 Meetings, including Exit**

The team presented the inspection results to Mr. A. J. Jordan, Site Vice President, and other members of Dominion's staff at an exit meeting on November 18, 2010. The team returned the proprietary information reviewed during the inspection and verified that this report does not contain proprietary information.

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**ATTACHMENT**

**SUPPLEMENTAL INFORMATION**

**KEY POINTS OF CONTACT**

Dominion Personnel

D. Bajumpaa, Design Engineer  
B. Burnham, Senior Engineer  
T. Cleary, Licensing Engineer  
K. Cyr, Senior Engineer  
W. Faye, Design Engineer  
N. Jaycox, Sr. Mechanical Project Engineer  
D. MacNeill, Design Engineering Supervisor  
D. Robinson, Senior Engineer  
J. Roddy, Project Engineer  
R. Ryan, Procurement Engineering Technical Specialist  
L. Salyards, Licensing Engineer  
R. Sterner, Senior Engineer

**LIST OF ITEMS OPENED, CLOSED AND DISCUSSED**

None.

**LIST OF DOCUMENTS REVIEWED**

10 CFR 50.59 Evaluations

S2-EV-07-0001, Safety Evaluation for Procedure OP 2326D (SW Pump Strainer Backwash Piping to Alternate Bay), Rev. 0  
S2-EV-08-0001, Safety Evaluation for Procedure OP 2304H (Boric Acid Addition to CVCS from SFP Cask Laydown Pit), Rev. 0  
S2-EV-08-0002, Safety Evaluation for Main Steam Line Break Dose Analysis, Rev. 2  
S2-EV-08-0004, Safety Evaluation for LBDCR 07-MP2-010 (TRM Change for Adoption of Functionality Definition and Elimination of Shutdown Requirements), Rev. 0  
S2-EV-09-0001, Safety Evaluation for UFSAR Change Request MP2-UCR-2009-002, Rev. 0  
S2-EV-09-0002, Safety Evaluation for Temporary Change MMOD DM2-00-0200-09, Rev. 0  
S2-EV-09-0003, Safety Evaluation for In-Core Instrument Thimble Tube Replacement, Rev. 0  
S3-EV-07-0001, Safety Evaluation for Planned High Burnup of One Lead Test Assembly, Rev. 0  
S3-EV-09-0001, Safety Evaluation for FSC MP3-UCR-2009-007 (UFSAR Update to Reflect Change in the Calculated Maximum Containment Liner Temperature), Rev. 0

10 CFR 50.59 Screened-out Evaluations

AOP 2572, Loss of Non-Vital Instrument Panel VR-11, Rev. 009-05  
 AOP 3561, Loss of Reactor Plant CCW, Rev. 11-00  
 DCN DM2-00-0031-07, Lower 4160 Vac Vital Switchgear Replacement Cooling Coil, Rev. 0  
 DCN DM2-00-0192-07, Pressure Gauges for EDG Heat Exchangers, Rev. 0  
 DCR M3-07022, Temperature Re-Rate of the CCW System, Rev. 0  
 DCR M3-08010, Procedure Change for AFW Transition to a Main Feedwater Pump, Rev. 0  
 DM2-00-0039-10, Letdown Temperature Controller TIC-223 Replacement, Rev. 0  
 DM2-00-0243-07, Replacement of Annunciator Ground Detector Switches, Rev. 0  
 DM2-00-0254-08, 125 Vdc Distribution Panel DV20 Undervoltage Relay Replacement, Rev. 0  
 DM3-00-0078-08, Revision to EDG Air Dryer Control Timer Logic, Rev. 0  
 DM3-00-0320-08, Removal of 'A' and 'B' Turbine-Driven Feed Pump Oil Pressure Switches  
     3TFC-PS37A 3TFC-PS37B, Rev. 0  
 DM3-00-0410-08, Change Process Setpoint and Instrument Channel Error for 3FWA\*PS52A,  
     3FWA\*PS52B, and 3FWA\*PS52C, Rev. 0  
 Field Change Procedure Form for OP 3304A (Charging and Letdown), Rev. 030-09, FCN #1  
 M2-08006, Control Wiring for Charging Pumps, Rev. 00  
 OP 2347D, Backfeeding Unit 2, Rev. 016-04

Modification Packages

\*DM2-00-0042-07, EDG Operating Time with 24,000 Gallons of Ultra Low Sulfur Diesel Fuel Oil  
     Available at Continuous Load of 2750 kW, Rev. 4  
 \*DM2-00-0152-07, Removal of Check Valve 2-CS-26 Internals and Relocate Heat Trace  
     Controlling Temperature Switch TS-2542, Rev. 0  
 \*DM2-03-0128-08, PORV 2-RC-404 RTD TE-114 Relocation and Setpoint Change, Rev. 3  
 \*DM3-00-0190-08, Inadequate Circuit Isolation of 3SWP\*MOV102A, 3SWP\*MOV102C, Rev. 0  
 \*Evaluation of Stem Thrust Requirements for 3RHS\*MV8701B, 3RHS\*MV8702A, Rev. 1  
 \*M2-07002, Replacement of Unit 2 Charging Pump Discharge Pulsation Dampeners, Rev. 0  
 \*M3-06004, Vital Inverters Replacement, Rev. 0  
 \*M3-07001, MP3 'A' and 'C' Charging Pump Rotating Assembly Replacement, Rev. 1  
 \*P(R)-1062, Net Positive Suction Head Available to 3QSS\*P3A & B, Rev. 1  
 \*P(R)-711, Reactor Plant Component Cooling System Surge Tank Sizing, Rev. 1  
 DM3-00-0189-07, T<sub>hot</sub> Signal Filter and Rate/Lag Cards to T<sub>hot</sub> Filters, Rev. 0  
 DM3-00-0298-07, Pressurizer Level Control Program, Rev. 0  
 DM3-00-1598-96, Addition of Pulsation Dampeners to 3IAS-PI18A and 3IAS-PI18B, Rev. 0  
 OP 2326D, SW Pump Strainer Backwash Piping to Alternate Bay, Rev. 2

(\* designates a modification and 10 CFR 50.59 screened-out evaluation sample)

Calculations and Analyses

120E, AC Cable Size Verification - Vital Bus Feeders, Rev. 2  
 12179-C10.709, Equipment Pad Control Building, Rev. 0  
 151E, Panel Loading for Class 1E and Non-Class 1E Channels 1-4, Rev. 1  
 177E, 120 Vac System Short Circuit Study, Rev. 01  
 182E, 120 Vac System Voltage Profile, Rev. 1

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211E, Voltage Verification for 120V Vital Bus Circuits, Class 1E, Revs. 0 and 1  
 31024-01674E3, MP3 Component Response Time Acceptance Criteria, Rev. 0  
 3442C10-01215E3, Calibration Data - Pressurizer Pressure Channel Calibration, Rev. 2  
 3469N08-0435213, 3RCS-TY412B Pressurizer Level Control Program Scaling, Rev. 0  
 3-ENG245, Delta T/T<sub>avg</sub> Channel Calibration Data, Rev. 13  
 91-BOP-813-ES, MP2 EDG Operating Time with 24,000 Gallons of Diesel Fuel Oil Available at Continuous Rated Load of 2750 kW, Rev. 4  
 97-122, ECCS System Analysis, Rev. 3  
 ATJ-003, Alternate Test Justification for 2-CH-177, Rev. 2  
 BAT1-96-1241E3, Battery 1 and Charger, Associated Cable and Device Verification, Rev. 2  
 BAT2-96-1243E3, Battery 2 and Charger, Associated Cable and Device Verification, Rev. 2  
 BAT3-96-1245E3, Battery 3 and Charger, Associated Cable and Device Verification, Rev. 0  
 BAT4-96-1246E3, Battery 4 and Charger, Associated Cable and Device Verification, Rev. 0  
 Bechtel 040A, Containment Spray Test Header to RWST, Stress Problem 40A, Rev. 04  
 COMBLOAD-1325M3, Determination of Fire Severity for Fire Protection Report, Rev. 0  
 EVAL-ENG-RSE-M2C20, Reload Safety Evaluation Millstone Unit 2 Cycle 20, Rev. 1  
 LEAD/LAG-01206E3, Calibration Data - RPS/ESFAS Lead/Lag, Rate Lag Compensators, Rev. 1  
 MP3-ENG-ETAP-04125E3, MP3 Electrical Distribution System Analysis, Rev. 0  
 NI-033, EDG Load Start KVA Calculation, Rev. 4  
 NUS-A134SA, Equivalency Review of the PID 901-540 to the GE/MAC Type 540-01, Rev. 1  
 PRA02NQA-03131S2, MP2 Impact on Containment Release Frequencies, Rev. 2  
 SBO-COPE-1440E3, Battery Size Calculation for Eight-Hour SBO for Millstone Unit 3, Rev. 1

#### Corrective Action Documents (\* denotes NRC identified during this inspection)

06-09303	09000010	150042	337762	388281
07-06330	10001120	173253	344309	390469
07-08295	114592	175909	344386	393157
07-09464	116014	181074	354072	401952
08-00749	116736	318737	355006	403897*
06002757	117113	324869	382515	403932*
08000102	125619	330927	386459	404663*
08000442	143621	333673	386963	97021449

#### Drawings

0253-366189-002, 1 ¼-Wh260 Socket-Weld Thermowell, Rev. 3  
 25203-20150, Containment Spray Test Header to RWST HCD(C) ISO, Sh. 698, Rev. 8  
 25203-20150, MPS2 BCA-2 Pressurizer Relief Discharge to Quench Tank, Sh. 1075, Rev. 1  
 25203-20150, Pressurizer Safety and Relief Valve Discharge to Quench Tank, Sh. 366, Rev. 17  
 25203-20219, MPS2 Pressurizer Safety and Relief Valve Discharge Piping, Sh. 1, Rev. 5  
 25203-26015, High Pressure Safety Injection Pumps, Sh. 2, Rev. 39  
 25203-26017, Boric Acid System, Sh. 3, Rev. 43  
 25203-26023, Spent Fuel Pool Cooling and Cleanup System, Sh. 2, Rev. 30  
 25203-28500, MPS2 TE-114 Train 'B' Pressurizer to Quench Tank Loop Diagram, Sh. 74, Rev. 1  
 25203-28500, MPS2 TT-223 Letdown Heat Exchanger X22 Loop Diagram, Sh. 222, Rev. 4

25203-29042, 150 Stainless Steel Bolted Bonnet Swing Check Valve, Sh. 14, Rev. C  
 25203-37005, Block Diagram Electric Freeze Protection, RWST, T-41, Sh. 99, Rev. 3  
 25212-28965, Press Instr-Air Serv Instr Below Tap, Press 150 psig & Below, Sh. 1, Issue 3  
 473-1, Reactor Plant Component Cooling Surge Tank Mark No. 3CCP-TK1, Rev. 4

### Procedures

AOP 2572, Loss of Non-Vital Instrument Panel VR-11, Rev. 009-05  
 C SP750, Battery Weekly and Quarterly Surveillance, Rev. 002-02  
 DCM 03, Plant Changes, Rev. 017-01  
 DNAP-3004, Program for 10 CFR 50.59 and 72.48 – Changes, Tests, and Experiments, Rev. 4  
 EN 21221, MP2 Check Valve Inspections, Rev. 003-01  
 IC 3469N08, Rod Control Speed and Control T<sub>ave</sub> Alarm Data Sheet, Rev. 002-03  
 IC 3469N08, Rod Control Speed and Control T<sub>ave</sub> Alarms, Rev. 004-01  
 IC 3469N08, Rod Control Speed and Control T<sub>ave</sub> Auctioneered/Deviation Alarms, Rev. 004-01  
 LI-AA-301, Implementation of 10 CFR 21, Reporting of Defects and Noncompliance, Rev. 0  
 MP 2721W, SFP Gate Maintenance and Movement, Rev. 008  
 MP 3746XA, Charging Pump Maintenance, Rev. 006-05  
 MP-03-DCC-GDL02, Temporary Plant Changes (Superseded), Rev. 002  
 OP 2304E, Charging Pumps, Rev. 017-01  
 OP 2304E11, 'A' Charging Pump Maintenance, Rev. 001  
 OP 2304H, Boric Acid Addition to CVCS from SFP Cask Laydown Pit, Rev. 001-01  
 OP 2305B, RWST Purification, Rev. 000-02  
 OP 2309X11, 'A' Containment Spray Pump IST for New Baseline, Rev. 000-02  
 OP 2309X21, 'B' Containment Spray Pump IST for New Baseline, Rev. 000-02  
 OP 2326D, Service Water Pump Strainer Backwash Piping to Alternate Bay, Rev. 000-02  
 OP 2354D, Draining ECCS Components and Piping, Rev. 000-08  
 OP 3353.MB1C, Main Control Board 1C Annunciator Response, Rev. 005-15  
 OP 3353.MB8A, Inverter 1 Trouble, Rev. 002-10  
 OP-2326A, Service Water System, Rev. 023-07  
 OP2347D, Backfeeding Unit 2, Rev. 016-04  
 OP-AA-100, Administrative Procedure: Conduct of Operations, Rev. 10  
 OP-AA-102-1001, Development of Technical Basis to Support Operability Determinations, Rev. 2  
 PI-AA-200, Corrective Action, Rev. 14  
 SP 21236, Disassembly and Stroke Testing of Check Valves in the IST Program, Rev. 001-05  
 SP 2601J, CVCS Check Valve Tests, Rev. 004-09  
 SP 2606I, High Flow Inservice Testing of 'A' CS Pump and Check Valves, Rev. 000-02  
 SP 2606J, High Flow Inservice Testing of 'B' CS Pump and Check Valves, Rev. 000-02  
 SP 3442D01, Pressurizer Water Level Calibration, Rev. 010-05  
 SP 3604A.1, Charging Pump 'A' Operational Readiness Test, Rev. 014  
 SP 3604A.3, Charging Pump 'C' Operational Readiness Test, Rev. 011-04

### Completed Surveillance & Functional Test Procedures

3CHS\*P3A, Operational Readiness Test (Two Charging Pumps Aligned for Service) (3/18/08, 5/15/08, 8/17/08, 1/21/09, 4/15/09, 3/24/10)  
 C SP750, Unit 3 – Battery Quarterly Inspection (10/6/10)  
 CPT 1407A-001, Ametek Inverter Meter Calibration Data Sheet (10/24/08)

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IC 2418B, Pressurizer Relief Valve Temperature Input Loops Calibration Data Sheet (11/2/09)  
 IC 2429D3, RWST Cold Weather Preparations Instrument Calibration Data Sheet (4/23/08)  
 IC 3469N08-001, Rod Control Speed and Control Tave Alarm Data Sheet (10/19/05, 5/05/07)  
 MA-AA-102, Foreign Material Exclusion Evaluation on M2L1A (4/14/10)  
 MA-AA-102, Foreign Material Exclusion Evaluation on M2L1C (2/9/10)  
 MP 2701P, Outside Tank Freeze Protection Heat Trace Inspection (4/21/08)  
 MP 2702C9, Pacific Bolted Bonnet Swing Check Valve Overhaul (4/20/08)  
 MP-20-WP-GDL40, PMT Plan for 2-CS-26 Internals Removal (4/25/08, 5/10/08)  
 OP 2326A-002, Service Water Alignment Verification, Facility 2 (2/15/10, 4/14/10)  
 SP 2612B-003, 'C' SW Pump and Facility 2 Discharge Check Valve IST (2/15/10)  
 SP 3442A10-001, Delta T/T<sub>avg</sub> Channel 1 Calibration Data Sheet (10/23/08)  
 SP 3442A20-001, Delta T/T<sub>avg</sub> Channel 2 Calibration Data Sheet (10/24/08)  
 SP 3442A30-001, Delta T/T<sub>avg</sub> Channel 3 Calibration Data Sheet (10/22/08)  
 SP 3442A40-001, Delta T/T<sub>avg</sub> Channel 4 Calibration Data Sheet (10/27/08)  
 SP 3442C10-001C, Pressurizer Pressure Channel 1 Heater Control/Deviation Alarm (10/17/08)  
 SP 3442C10-001R, Pressure Input to OTDT Setpoint: Protection 1 (10/23/08)  
 SP 3442C20-001R, Pressurizer Pressure NR Channel 2 Rack Calibration Data Sheet (10/24/08)  
 SP 3442C30-001R, Pressurizer Pressure NR Channel 3 Rack Calibration Data Sheet (10/22/08)  
 SP 3443A21-001, Protection Set Cabinet 1 Operational Test Data Sheet (11/1/08)  
 SP 3443B21-001, Protection Set Cabinet 2 Operational Test Data Sheet (11/3/08)  
 SP 3443C21-001, Protection Set Cabinet 3 Operational Test Data Sheet (10/31/08)  
 SP 3443D21-001, Protection Set Cabinet 4 Operational Test Data Sheet (11/4/08)  
 SP 3673.2-009, Fire Transfer Switch Panel Operational Testing – 3SWP\*MOV102A and  
 3SWP\*MOV102C (9/17/08)  
 SPROC ENG07-3-001, DCR M3-06004 Inverter Replacement (4/27/07)  
 SPROC OPS 09-2-01, Post-Modification Test of Unit 2 Charging Pumps After Pulsation  
 Dampeners Installation (8/26/09, 9/18/09)

### Work Orders

53102184534	53102354613	53M30711650	M3 0415663
53102231909	53M20807011	53M30711913	M3 0513631
53102285155	53M30711647	53M30711914	M3 0703895
53102317677	53M30711648	M2 0709960	
53102333892	53M30711649	M2 97173	

### Vendor Technical Documents

25212-MP3-SFR, Safety Functional Requirements Manual, Rev. 5 and 6  
 53805-1, Certification Test Report for Seismic Testing of a 25 KVA DC Inverter, 'A' 25 KVA  
 Isolimiter, and a 25KVA Remote Manual Switch, 9/25/06  
 25203-300-050A, Type 540 Series Controllers, 9/18/97

### Miscellaneous

Audit 10-03, Engineering Programs and Design Control, 8/19/10  
 Coltec Engineering Report R5.08-0545, Fuel Consumption Rates for MP2 EDG Sets, 12/16/93  
 DOE, Energy Information Administration: The Transition to Ultra-Low-Sulfur Diesel Fuel, 2/23/07  
Attachment

IEEE 10000008924, Controller, GE/MAC 540, Scientech PID 901-540/Millstone Unit 2, Rev. 0  
Material Receipt Inspection Report Package, Material Document # 4900035050-08, Inspection  
Instructions and Results for ½" Pressure Snubber – Stainless Steel, 1/30/08  
Material Receipt Inspection Report Package, Material Document # 4900208598-08, Inspection  
Instructions and Results for ½" Pressure Snubber – Stainless Steel, 6/10/08  
Material Receipt Inspection Report Package, Material Document # 4900286943-08, Inspection  
Instructions and Results for ¼" Pressure Snubber – Monel, 8/14/08  
Material Receipt Inspection Report Package, Material Document # 5000196711, Inspection  
Instructions and Results for ¼" NPT Pulsation Dampener - Brass, 9/19/07  
MP-14-OPS-GDL600, Plant Status and Configuration Control, Rev. 004  
Part 21 Notification 2010-28-00, EDG Inoperable in Excess of Technical Specifications  
Completion Time Due to Output Breaker Failure, 6/1/10  
PDCR MP3-94-103, Snubber Installation in Various Pressure Indicator Sensing Lines, Rev. 0  
PTE 9004748-V01, M3708761 - Snubber, Pressure, Stainless Steel, 12", Revision to Add  
M3708761 to Evaluation and Inspection Plan 1257, 1/30/08  
PTE 9004748-V02, Upgrade of M370876R to 42124455 – Snubber, Pressure, Stainless Steel,  
12", Revision to Add 42124455 to Evaluation and Inspection Plan 1257, 6/10/08

Design and Licensing Bases

DBS-2350, Refueling Water Storage Tank & Containment Sump System, Rev. 0  
DBS-2415, MPS2 Inadequate Core Cooling and In-Core Instrumentation Systems, Rev. 0  
DM2-00-0200-09, Temporary Credit for Local Manual Action Outside Control Room, RWST  
Purification Sub-system, 10/1/09  
SP-EE-076, Standard Specification for Electrical Installation, Rev. 7  
SP-M2-EE-002, Attachment M, TI-106, 107, 108 and 114 Specific Indicator Configuration  
Parameters and Features, Rev. 2

## LIST OF ACRONYMS

°F	Degrees Fahrenheit
ADAMS	NRC Document System
CCW	Component Cooling Water
CFR	Code of Federal Regulations
CR	Condition Report
CS	Containment Spray
DRS	Division of Reactor Safety
ECCS	Emergency Core Cooling Systems
EDG	Emergency Diesel Generator
IP	Inspection Procedure
kW	kilo-Watts
MOV	Motor-Operated Valve
NEI	Nuclear Energy Institute
NRC	Nuclear Regulatory Commission
NPSH	Net Positive Suction Head
OPDT	Over-Power Delta Temperature
OTDT	Over-Temperature Delta Temperature
PARS	Publically Available Records
PORV	Power Operated Relief Valve
QS	Quench Spray
RCS	Reactor Coolant System
RTD	Resistance Temperature Detector
RWST	Refueling Water Storage Tank
SW	Service Water
T <sub>avg</sub>	Average Temperature
T <sub>hot</sub>	Hot Leg Temperature
Vac	Volts, Alternating Current
UFSAR	Updated Final Safety Analysis Report